

CLAIMS:

1. An isolated GlcNAc-phosphotransferase.

2. The GlcNAc-phosphotransferase of Claim 1 which comprises an α , β , and γ subunit.

5 3. The GlcNAc-phosphotransferase wherein the α -subunit comprises the amino acid sequence in SEQ ID NO:1, the β -subunit comprises the amino acid sequence in SEQ ID NO:2, and the γ -subunit comprises the amino acid sequence in SEQ ID NO:3.

10 4. The GlcNAc-phosphotransferase of Claim 3, wherein the α -subunit comprises amino acids 1 to 928 of SEQ ID NO:1, the β -subunit comprises amino acids 1 to 328 of SEQ ID NO:2, and the γ -subunit comprises amino acids 25 to 305 of SEQ ID NO:3.

5. An isolated nucleic acid encoding the GlcNAc-phosphotransferase of Claim 3.

6. The isolated nucleic acid of Claim 5, comprising SEQ ID NO:4 and SEQ ID NO:5.

15 7. The isolated nucleic acid of Claim 5, wherein an α -subunit coding region is contained in nucleotides 165 to 2948 of SEQ ID NO:4, an β -subunit coding region is contained in nucleotides 2949 to 3952 of SEQ ID NO:6, and a γ -subunit coding region is contained in nucleotides 96 to 941 of SEQ ID NO:5.

8. An isolated nucleic acid which hybridizes under stringent conditions to at least one of the isolated nucleic acids of Claim 6, wherein said stringent conditions comprise washing in 0.2X SSC and 0.1% SDS at 65°C.

9. A vector comprising the isolated nucleic acid of Claim 5.

5 10. A host cell comprising the isolated nucleic acid of Claim 5.

11. A method of producing biologically active GlcNAc-phosphotransferase comprising

culturing the cell of Claim 10 under conditions suitable for expression of the isolated nucleic acid molecule; and

10 recovering the biologically active GlcNAc-phosphotransferase.

12. The isolated GlcNAc-phosphotransferase of Claim 2, wherein the α -subunit has the amino acid sequence in SEQ ID NO:15, the β -subunit has the amino acid sequence in SEQ ID NO:8, and the γ -subunit has the amino acid sequence in SEQ ID NO:9.

13. An isolated nucleic acid encoding the GlcNAc-phosphotransferase of Claim 12.

15 14. The isolated nucleic acid of Claim 13, comprising SEQ ID NO:16 and SEQ ID NO:10.

15. An isolated nucleic acid comprising a nucleic acid which hybridizes under

stringent conditions to at least one of the isolated nucleic acids of Claim 14, wherein said stringent conditions comprise washing in 0.2X SSC and 0.1% SDS at 65°C.

16. A vector comprising the isolated nucleic acid of Claim 13.

17. A cell comprising the isolated nucleic acid of Claim 13.

5 18. A method of producing biologically active GlcNAc-phosphotransferase comprising
culturing the cell of Claim 17 under conditions suitable for expression of the isolated nucleic acid molecule; and
recovering the biologically active GlcNAc-phosphotransferase.

10 19. An antibody which binds the GlcNAc-phosphotransferase of Claim 1, wherein said antibody is produced by the PT18 hybridoma deposited at the ATCC under the accession No. _____.

15 20. A method of isolating GlcNAc-phosphotransferase comprising
contacting a cellular lysate containing said GlcNAc-phosphotransferase with the antibody of Claim 19, wherein an the GlcNAc-phosphotransferase and the antibody form a complex; and
isolating the antibody-GlcNAc-phosphotransferase complex.

20 21. A method of producing a GlcNAc-phosphotransferase in a cell comprising

transfecting into said cell a DNA construct comprising a targeting sequence homologous to a target site within or upstream of a endogenous GlcNAc-phosphotransferase gene contained in the cell, wherein said endogenous gene comprises the sequence in SEQ ID NO:4 or SEQ ID NO:5, an exogenous regulatory sequence, an exon, and an unpaired splice-donor site at the 3' end of the exon, wherein said transfecting generates a homologously recombinant cell in which the splice-donor site is operatively linked to the second exon of the endogenous gene, and the exogenous regulatory sequence controls transcription of the construct driven, the endogenous gene, and any sequence lying between the construct-driven exon and the endogenous gene, to produce a RNA transcript that encodes the GlcNAc-phosphotransferase, so that the homologously recombinant cell produces the GlcNAc-phosphotransferase.

22. An isolated amino acid sequence comprising SEQ ID NO:1

23. An isolated nucleic acid which encodes the amino acid sequence of Claim 22.

24. The isolated nucleic acid of Claim 23 comprising nucleotides 165 to 2948 of SEQ ID NO:4.

25. An isolated nucleic acid which hybridizes under stringent conditions to the isolated nucleic acid of Claim 24, wherein said stringent conditions comprise washing in 0.2 X SSC and 0.1% SDS.

26. A vector comprising the isolated nucleic acid of 23.

27. A host cell comprising the isolated nucleic acid of Claim 23.

28. An isolated amino acid sequence comprising SEQ ID NO:2

29. An isolated nucleic acid which encodes the amino acid sequence of Claim 28.

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30. The isolated nucleic acid of Claim 29 comprising nucleotides 2949 to 3952 of
SEQ ID NO:4.

31. An isolated nucleic acid which hybridizes under stringent conditions to the
10 isolated nucleic acid of Claim 30, wherein said stringent conditions comprise washing in 0.2
X SSC and 0.1% SDS.

32. A vector comprising the isolated nucleic acid of 29.

33. A host cell comprising the isolated nucleic acid of Claim 29.

34. An isolated amino acid sequence comprising SEQ ID NO:3.

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35. An isolated nucleic acid which encodes the amino acid sequence of Claim 34.

36. The isolated nucleic acid of Claim 35 comprising nucleotides 25 to 305 of SEQ
ID NO:3.

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37. An isolated nucleic acid which hybridizes under stringent conditions to the isolated nucleic acid of Claim 36, wherein said stringent conditions comprise washing in 0.2 X SSC and 0.1% SDS.

38. A vector comprising the isolated nucleic acid of 35.

5 39. A host cell comprising the isolated nucleic acid of Claim 35.